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**DEVELOPMENT OF AN EFFECTIVE SPECIAL THERAPY BED
MANAGEMENT SYSTEM AT WALTER REED ARMY MEDICAL CENTER**

**A Graduate Management Project
Submitted to the Faculty of
Baylor University
In Partial Fulfillment of the
Requirements for the Degree
of
Master of Health Administration
by
Captain Mark D. Hines, AN
December 1991**

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Abstract

Walter Reed Army Medical Center (WRAMC), the largest medical center in the Army Medical Department health care system, has identified problems in its use of special therapy beds. Special therapy beds are complete bed units that provide either skin pressure relief or spinal stability for critically ill immobile patients. The current special therapy bed management system at WRAMC is inefficient, unorganized, and costly. It is difficult to track the use of these expensive beds within the medical center. This study consisted of a case study analysis of the organizational environment surrounding the procurement and use of special therapy beds. The examination of the current system included (a) a historical review of the use of these beds at WRAMC, (b) a description of the administrative structure managing the beds, and (c) a review of the processes involved in procuring special therapy beds. Telephone surveys provided information on special therapy bed management systems at several large civilian and military hospitals. Recommendations for improving the system included (a) the addition of the clinical nurse specialists into the process as clinical experts to review all requests for the use of

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pressure relieving devices, (b) providing an educational program to supplement vendor sponsored inservices, (c) developing a computerized database system to track the clinical and financial aspects of special therapy bed use at WRAMC, (d) changing the initial special therapy bed rental period to 30 days, and (e) including the clinical nurse specialists in the decision making process for special therapy beds rented after duty hours and on weekends. Implementation of these recommendations should improve the efficient and effective management of special therapy beds at Walter Reed Army Medical Center.

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Chapter I - Introduction

Conditions Which Prompted the Study

As health care costs in this country continue to escalate, health care providers will need to be more cognizant of cost efficiency as it relates to the provision of high quality health care. A significant portion of this apparent unending increase in costs can be linked to an explosion of health care technology in the United States. One of the technological advances in recent years has been the development of special therapy beds. Critically ill immobilized patients in both acute care and long term care facilities require the use of special therapy bed technology. Prevention and treatment of skin breakdown is the primary rationale for the use of these beds.

Special therapy beds will continue to be a valuable aid to the medical regimen of critically ill immobilized patients. Problems associated with these special therapy beds have been identified at Walter Reed Army Medical Center (WRAMC), the largest medical center in the Army Medical Department (AMEDD) health care system. Walter Reed Army Medical Center is a 1000 bed teaching hospital located in northern Washington D.C.

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In peacetime, WRAMC operates approximately 850 beds with an average daily census of between 650 and 750 patients. WRAMC provides health services to a large population of active duty, retired, and dependent military beneficiaries. It serves as a tertiary referral center for many of the AMEDD medical activities in the continental United States and throughout the world.

Many of the twenty-nine inpatient wards at WRAMC utilize special therapy beds. At present, WRAMC obtains these beds through several different methods, to include direct purchase and rental arrangements. Multiple contracts with multiple vendors exist for the procurement of these beds. Special therapy beds require continual tracking as medical and nursing staff often relocate these beds throughout the medical center as a patient's condition changes. In addition, the WRAMC-owned special therapy beds require preventive maintenance and frequent repair from internal maintenance assets.

The procurement and tracking of these special therapy beds within the medical center consumes many hours of valuable administrative time. In fact, it is the administrative element of the current special

therapy bed management system that has raised the most concern over the operation and cost of managing these beds.

Statement of the Management Problem

The use of special therapy beds at WRAMC is inefficient, costly, unorganized, and poorly tracked.

Review of the Literature

Special therapy beds, also called therapeutic or specialty beds, are complete bed units that provide for skin pressure relief, spinal stability, and treatment of other life threatening complications of immobility (Ceccio, 1990). The leading complications of immobility include pulmonary emboli, deep vein thrombosis, and pressure sores (Peoples, McGarrah, Green, Tuggle & Hayne, 1990). Each of these conditions can be attributed to the stasis of blood flow in the affected area. Peoples et al. (1990) estimate that over 200,000 people die each year from pulmonary emboli alone, and that between 15 and 42% of immobile hospitalized patients develop either pulmonary emboli or deep vein thrombosis during their hospital stays.

Pressure sores are another major complication of patient immobility. A pressure sore is an area of local tissue necrosis, usually over a bony prominence,

that results from decreased blood supply to an affected area. Excessive or prolonged pressure applied to the skin causes the interstitial fluid pressure to increase to a level greater than that of the venous pressure. This slows the flow of blood through tissues. The decrease in blood flow leads to poor oxygenation of the skin, a shift from aerobic to anaerobic metabolism and finally tissue necrosis (Wienke, 1987).

Estimates of the incidence of pressure sores in the United States vary widely. Maklebust, Mondoux & Sieggren (1986) suggest that from 3 to 5% of the 36 million patients admitted annually to health care facilities develop pressure sores. This equates to between 1.1 and 1.8 million patients a year. Peoples, et al. (1990) estimate that 14 to 20% of all hospitalized patients have some degree of pressure sore. Ceccio (1990) suggests that from 3 to 14% of patients in acute care settings develop significant pressure sores. This figure jumps to between 15 and 25% for those in long term care settings.

The nosocomial complication of immobility is so prevalent in long term care facilities that in 1989 Medicare/Medicaid developed new quality of care requirements for the assessment and prevention of

pressure sores. These requirements compel health care providers to ensure that patients admitted to long term care facilities without pressure sores do not develop them during their stay (Higgins, 1990).

In response to this growing incidence of immobility complications related to inpatient hospitalization and long term care of the elderly, health care providers began looking for better bed surfaces for their high risk patients. The search for a pressure relieving bed surface began in the late 1960s with the advent of the air fluidized beds (Hargest and Artz, 1969).

Today, there are many different varieties of pressure relieving beds and devices on the market. The recent growth of the special therapy bed industry can be linked to (a) the growing population of frail elderly living in long term care facilities and occupying acute care beds, (b) the trend to respond early and aggressively to stabilize multiple trauma or spinal cord injury patients, (c) technological advances in pressure reducing beds and devices, (d) an emphasis on quality assurance, especially in the area of skin care, and (e) enhanced rewards under the prospective payment system for prevention of costly immobility

complications (Ceccio, 1990).

Theoretically, pressure reducing beds and devices decrease the pressure, friction and shearing forces associated with immobility on a static bed surface. Studies completed by Landis in 1930 demonstrated that any internal or external force greater than 32 mm of mercury can cause capillary compression leading to tissue hypoxemia and necrosis (Jester & Weaver, 1990). Special therapy beds reduce the pressure exerted to skin surfaces located over bony prominences to a level below 32 mm of mercury. These beds also reduce the shearing forces associated with immobility. Shearing of skin surfaces occurs when friction builds between the skin and the bedding material (Peoples et al., 1990). In the setting of a moist environment, the forces of pressure and friction (shearing) are the leading contributors to the development of pressure sores on the fragile skin of debilitated patients (Weinke, 1987).

Three distinct categories of special therapy beds exist today. These categories are air fluidized, low air loss, and the kinetic therapy rotating support surface beds. Two other categories of "obese" (for patients over 300 pounds) and "special function"

(pulsating) beds are also available (Willey, 1989).

The air fluidized therapy bed consists of a rectangular tank filled with millions of microscopic (50-150 micron) soda-lime glass beads called microspheres (ECRI, 1989). When turned on, warm filtered air is blown into the tank causing the microspheres to act as a fluidal medium for the immobile patient. A loosely fitting filter sheet covers the tank. This sheet prevents the beads from escaping but allows body fluids to pass into the microsphere bath. Moisture in the tank mixes with the microspheres creating small clumps which sink to the bottom of the tank. These clumps are removed during cleaning of the tank (ECRI, 1990). Due to the constant high flow of warm air through the beads and to the patient, health care providers must be concerned with the steady evaporation of patient bodily fluids, and the subsequent dehydration that occurs.

Low air loss beds have a bed surface composed of either 21 or 23 waterproof, polyurethane-coated nylon air cushions placed in series on a standard bed frame. The cushions contain warm filtered air that escapes at a controlled rate to prevent dehydration and promote drying of the skin (Ceccio, 1990). The air cushions

are divided into several groups based on different areas of the body supported. Each of these groups has its own pressure control valve to allow for the individualized support of each patient.

Recent developments in low air loss therapy allow for alternating inflation and deflation of cushions, permitting side to side rotation of the patient. This active low air loss therapy has been shown to be effective in the treatment of immobile patients with respiratory compromise (Ceccio, 1990).

The third major category of special therapy bed is the laterally rotating kinetic therapy bed. These beds prevent skin breakdown in spinal cord injured patients (Kollef & Witte, 1988). The bed frame continuously rotates side to side with the lengthwise midline serving as the axis of rotation. One side of the bed rotates downward a preset number of degrees, followed by a return to level and then a rotation downward on the opposite side. Various pads and supportive devices stabilize the patient in bed.

Clinical indications and implications for use of special therapy beds dominate the literature. Several citations suggest use of these beds in cases of burns, immobility, trauma, respiratory compromise, and

pressure sores (Lucke & Jarlsberg, 1985; Bolyard, Townsend & Horan, 1987; Cuzzel & Willey, 1987; McNabb & Hyatt, 1987; Wiley, 1989; Ceccio, 1990). The goal of pressure relief is to combine the lowering of pressure exerted on all skin surfaces with periods of complete withdrawal of pressure. Changing a patient's position every two hours limits their exposure to excessive pressure on any one skin surface (Weinke, 1987).

Often forgotten in the care of immobile patients at risk for pressure sore development is the role of proper positioning by nursing personnel. The repositioning of patients every two hours is the most appropriate intervention to aid in the prevention of pressure sores (Weinke, 1987). Some special therapy bed vendors, understanding the shortage of nursing personnel in this country, will market their device as a substitute for a patient's every two hour turning schedule (Jester & Weaver, 1990).

Following the initiation of specialty bed therapy, it becomes necessary to continually reassess the patient's skin condition. Health care providers skilled in managing skin breakdown conditions must complete the reassessments as needed. Several authors (Higgins, 1989; Klein & Gilroy, 1989; Peoples et al.,

1990; Thomas, 1990) recommend that quality assurance nurses, enterostomal nurses or infection control nurses serve as the subject matter experts on the care of patients with pressure related skin conditions.

Physicians and staff nurses could confer with these experts when evaluating a patient's potential for skin breakdown. These skin care experts would then suggest the proper pressure relieving device for the patient. Exercising the proper amount of management control over the pressure relief device approval process throughout a hospital can result in the appropriate utilization of special therapy beds, cost effectiveness, and operational efficiency (Thomas, 1990).

There are a many decision tree models and articles on bed selection criteria available in the literature to consult when selecting a special therapy bed or device (Cuzzell & Willey, 1987; Clark & Rowland, 1989; Thomas, 1989; Willey, 1989; Lovell & Anderson, 1990 and Maddux, 1990). The difficult part of the process is accurately assessing the potential for skin breakdown early enough to intervene and prevent a prolonged, costly hospital stay. In 1987, a group of nurse researchers developed the Braden scale for predicting pressure sore risk (Bergstrom, Braden, Laguzza &

Holman, 1987). This scale evaluates a patients activity, mobility, nutrition, moisture exposure, sensory perception, and friction (or shearing) potential.

Braden and Bergstrom (1989) suggest that better documentation of pressure sore incidence and skin breakdown risk assessment for patients treated with special therapy beds may show which of these beds or devices are cost effective. Health care providers responsible for skin assessment must understand the importance of continual assessment and the desire to transfer a patient to a mattress replacement or overlay when the patient no longer derives benefit from the special therapy bed (Thomas, 1989). These are some of the considerations surrounding the use of special therapy beds in a resource constrained health care environment.

The issue of cost effectiveness is beginning to dominate the special therapy bed literature. This is a change from earlier writings which were concerned more with the clinical implications for the use of the beds. Marklebust et al. (1986) estimated the cost of treating the average pressure sore at between \$14,000 and \$25,000 each with an annual expenditure in the U.S. of

\$3.5 to \$7 billion. A more recent estimate places the cost at \$30,000 for each pressure sore (Peoples et al., 1990).

The reason for such a high financial cost is the extended length of stays of patients treated for pressure sores. They spend between three and one half and five times longer in the hospital than patients without pressure sores (Peoples et al., 1990). Several health care institutions have examined the cost effectiveness of using these very expensive special therapy beds (Barnes & Rutland, 1986; Bristow, Goldfarb & Green, 1987; Greer, Morris, Walsh, Glenn & Keppler, 1988). However, these studies examined the use of the air fluidized beds which are usually much more expensive to rent than the low air loss beds.

In 1989, a study at a 650 bed military teaching hospital evaluated the procurement and use of all types of specialty beds within a hospital. This study focused on utilization management and how costs could be controlled without a detriment to the quality of patient care. Yaws and Deruvo (1989) noted that expenditures for special therapy beds during the first six months of fiscal year 1987 were more than twice that of the entire fiscal year 1986.

An investigating committee consisting of the quality assurance nurse, a nurse methods analyst, and several infection control nurses formed to collect data on the problems associated with special therapy bed use at this hospital. They reviewed multiple aspects of their system and provided recommendations on improving its cost effectiveness. They examined four objectives related to the provision of quality skin care to patients. These included an examination of (a) specialty bed systems at other similar hospitals, (b) the appropriateness of their own bed use, (c) the decision making process for placing patients onto beds, and (d) the legal issues associated with the use or lack of use of these expensive beds.

A survey of other similar hospitals revealed that all the facilities leased their low air loss beds. One hospital had purchased a low air loss bed but it was largely unused because of maintenance problems and improper cleaning.

The researchers conducted audits on 20 inpatient records. These audits revealed that all 20 cases were appropriate for special therapy bed use, but health care providers failed to adequately document important information in the patient's treatment record. The

audited charts frequently lacked information on the patient's skin condition prior to the use of the bed and the provider's own reasons for placing the patient on the bed.

The researchers determined that their facility had no standard protocol for the ordering of these beds. In addition, the medical and nursing staffs were not using other readily available, less expensive methods of treating and preventing skin breakdown. Consultations with a legal advisor did not uncover any litigation cases related to the use or lack of use of the special therapy beds.

Their recommendations included the establishment of a standard of practice for the use of special therapy beds, consultation with infection control nurses before ordering these devices, emphasis on skin assessment by nurses with the introduction of two comprehensive skin assessment forms, and the monitoring of the program by the quality assurance committee, the financial director and the nurse methods analyst.

Purpose

The purpose of this study was to design an efficient and effective special therapy bed management system for Walter Reed Army Medical Center.

Chapter II - Methods and Procedures

Study Design

The study of the special therapy bed management system at WRAMC included a case study analysis of the organizational environment surrounding the procurement and use of these beds. The examination of the current system entailed a historical review of the use of these devices at WRAMC as well as a description of the organizational structure and administrative processes involved in managing special therapy beds.

Data Collection

Interviews with personnel involved in the management of the current system and with those personnel attempting to correct deficiencies in the system provided useful information. Interviews with key personnel from administration, logistics, nursing, contracting, medical maintenance, resource management, information management, and the medical staff provided valuable information about the nature of the system and the scope of its associated problems.

Telephone surveys using a 27 question survey tool provided information on special therapy bed management systems at several local area hospitals. Five civilian and three federal hospitals of approximately the same

size were included in the survey. The survey tool consisted of 15 questions associated with the clinical aspects of the system and 12 questions on management issues related to the procurement, use, and tracking of these beds.

The examination of administrative memorandums and WRAMC regulations provided historical data and a unique perspective of the system. The first command policy outlining the use of air fluidized beds was established in 1986 and discussed the need to "control costs and better allocate limited resources" (J. H. Rumbaugh, personal communication, June 2, 1986).

Contractual records and financial reports offered worthwhile information on total resource outlays for the special therapy beds and also actual bed use rates over a selected period of time. Data from the contracting office was limited to one vendor due to the incompleteness of the other two vendor's contractual records. Records of committed funds for special therapy bed rentals from the Programming and Budget Office, Directorate of Resource Management were reviewed and totaled by floor for each of the last five fiscal years.

The case study analysis will not involve human

participants in an experimental design, and therefore ethical considerations are not relevant. Additionally, because of its qualitative nature, the case study analysis does not rely on statistical analysis of data. Issues of reliability and validity are not a concern within the scope of this study. The survey instrument asks for descriptive information on specialty bed management systems and is based upon criteria formulated by the researcher following a review of the literature.

Chapter III - Results

Organizational Structure - the DMAA

Review of the organizational structure in which the special therapy bed management system now operates involved examination of the Directorate of Medical Activities Administration (DMAA). This unique organizational structure provides health care administrative support to all clinical activities within WRAMC (Patillo, 1990).

In 1978, following the opening of a new 1000 bed treatment facility, the WRAMC administrative structure formally adopted the DMAA. A new concept in health care administration, Unit Administration (UA), was the basis for this organizational structure (Patillo, 1990).

The administrative support element attempted to pattern itself after the clinical model, hoping to better manage shortages of personnel and improve the quality of patient care delivered by health care providers (Patillo, 1990). A slightly altered version of the original concept exists today at WRAMC. The Director, DMAA, one of 10 Directorate level positions within the Medical Center, provides a link between the clinical and administrative activities through his

interactions at the command level. The Director, DMAA oversees the activities of six Associate Administrators, five of which have geographic responsibility for separate floors within the medical center.

The Unit Administrators work directly for the Associate Administrators and are responsible for two to four inpatient nursing units and/or one or more outpatient clinics within WRAMC (Patillo, 1990). They also have responsibility for managing several categories of support personnel assigned to their areas. These personnel include medical records technicians, logistics (medical supply) technicians, medical clerks, and housekeepers (Patillo, 1990).

A Unit Administrator on the Sixth Floor oversees the operation of the current special therapy bed system. Special therapy bed ordering and tracking responsibility rests with the Sixth Floor Central Receiving Office. The Central Receiving Office on each floor is staffed with logistics technicians responsible for providing logistical support to the medical activities on each floor. The Sixth Floor Central Receiving Office assumed the responsibility for ordering and tracking special therapy beds in 1988.

All user requests for special therapy beds are delivered to and processed in this office.

The DMAA is currently undergoing reorganization. The Associate Administrator/Unit Administrator concept will be replaced with a structure that establishes administrative elements within the clinical departments. Operational control over the administrative support structure will be given to clinical department chiefs. The newly formed Hospital Logistics Division (HLD), a division of the Directorate of Logistics, will manage the Central Receiving Offices. The HLD will be responsible for medical supply and resupply of the wards and clinics. They will also become responsible for the management of the special therapy bed system and will continue to direct that operation from the Sixth Floor Central Receiving Office.

History of Special Therapy Bed Management at WRAMC

The use of special therapy beds at WRAMC dates back to 1985. The practical inpatient application of kinetic therapy lateral rotation beds for spinal stabilization and air fluidized beds for severe skin integrity compromise was the impetus for beginning their use at WRAMC. During 1985 and 1986, WRAMC rented

both kinetic therapy and air fluidized beds. Due to the relative newness of these technologies, the high cost of daily rental fees soon became significant. This prompted the command's first attempt to control the use of special therapy beds.

In a memorandum dated June 2, 1986 the Deputy Commander for Clinical Services established a policy on the ordering of the air fluidized beds at WRAMC. The policy outlined the following requirements when placing an order for an air fluidized bed: (a) a physician's order documented in the patient's treatment record, (b) a memorandum to the appropriate clinical department or service chief that provided patient demographic data and the physician's reasoning for placing the patient on the bed, (c) the department chief's approval, and (d) a weekly progress note in the patient's treatment record reflecting clinical responses to therapy. This policy also limited the use of special therapy beds to increments of 14 days. If a bed was required beyond the initial 14 day period, the medical, nursing, and administrative staffs would have to repeat the same procedures (J. H. Rumbaugh, personal communication, June 2, 1986).

The DMAA floor administrators would process the

requests for special therapy beds and secure the delivery and setup of rented devices. The DMAA, in consultation with clinicians, established requirement specifications for the Directorate of Contracting to use during contract negotiation and ordering of rental beds (M. A. Turner, personal communication, December 7, 1987).

In the fall of 1988 WRAMC purchased five low air loss beds (Kinair TC, Kinetic Concepts Inc.). WRAMC had acquired one kinetic therapy bed (Roto-Rest, Kinetic Concepts Inc.) some time before the fall of 1988, but records detailing this purchase were incomplete. To support the purchase of the five low air loss beds, the DMAA developed a standard operating procedure (SOP) for use of the WRAMC-owned special therapy beds (see Appendix A). This SOP established the Sixth Floor Central Receiving Office as a central control point for the management of these beds. This office processed all clinician requests for beds, assisted Unit Administrators in obtaining WRAMC-owned beds for placement on requesting wards, and initiated all paperwork for bed rentals.

This SOP delineated the responsibilities of the Department of Nursing, Housekeeping, and DMAA during

bed use and turn in. Additionally, the SOP provided for the request and turn in of all special therapy beds during normal duty hours only (Monday through Friday, 0700-1600 hours), unless unusual circumstances required notification of the DMAA administrator on call.

During this same period, the Department of Nursing assigned the responsibility for skin care assessment and treatment of pressure sores to the clinical nurse specialists. Previously, the Enterostomal Therapy Service had managed all skin care consultations including those for pressure sores. In a memorandum dated November 28, 1988, the Chief, Department of Nursing outlined how ward nurses could consult the clinical nurse specialists on matters of pressure sore prevention and treatment as well as "the selection of pressure relief devices" required for patient care (M. Messerschmidt, personal communication, November 28, 1988).

Also in the fall of 1988, the Department of Nursing established clinical criteria for the use of special therapy beds. The Department of Nursing Administrative Policy F-10, dated November 1988, (see Appendix B) outlined nursing criteria for initiation of low air loss or air fluidized therapy. This policy

suggested use of special therapy beds for patients diagnosed with: (a) intractable pain, (b) closed head injuries, (c) spinal cord injuries, (d) burns or skin grafts, and (e) metastatic bone cancer. This was the first instance of written guidelines on the use of special therapy beds being made available to clinical nursing staff.

In June of 1989, WRAMC purchased three additional low air loss beds (Kinair TC, Kinetic Concepts Inc.), bringing the total to eight. Beginning in June of 1990, the Directorate of Resource Management organized several meetings with the WRAMC Chief of Staff/Deputy Commander for Administration to discuss several issues associated with the management of special therapy beds. These issues were (a) the development of a new SOP that would encompass the rental of all special therapy equipment to include beds and mattress replacements, (b) the payment of outstanding charges owed to vendors, and (c) a cost analysis regarding the purchase of additional beds.

As of May 1991, the WRAMC special therapy bed and mattress replacement SOP remains incomplete. The lack of an SOP is likely the result of the DMAA reorganization and the movement of special therapy bed

management control to the newly formed Hospital Logistics Division. Overdue payments to bed vendors decreased during the summer of 1990 but have recently begun to increase again. This increase is largely the result of inaccurate record keeping by the Contracting Division and the Sixth Floor Central Receiving Office during the early years (1985-1987) of special therapy bed rental at WRAMC. Special therapy bed vendors are beginning to collect on these overdue payments.

The Directorate of Resource Management drafted a decision paper in July 1990 to analyze the current environment and determine if WRAMC should purchase more pressure relieving devices or continue renting them with increasing frequency (see Appendix C). They estimated use rate increases of 11 percent from 1988 to 1989 and 33 percent from 1989 to 1990.

Considering a projected increase use in special therapy beds, the recommendation specified in the decision paper was to purchase four of the low air loss, dynamic flotation system (DFS) mattress replacements. The mattress replacements fit on a standard hospital bed frame and provide pressure relief similar to that of a standard low air loss bed. The request for the four mattress replacements is currently

going through review in the Directorate of Contracting.

WRAMC realized a surplus of funds at the end of fiscal year 1990. Using a portion of those surplus funds, WRAMC decided to purchase four additional low air loss beds (Kinair TC, Kinetic Concepts Inc.). This purchase brought the WRAMC-owned special therapy bed total to 12 low air loss beds and one kinetic therapy bed. In the fall of 1990, the kinetic therapy bed (Roto-Rest) was placed into storage in another building due to its infrequent use and limited storage space within the hospital.

Current Special Therapy Bed Management System

The following discussion of the processes involved in obtaining a special therapy bed or device at WRAMC is based upon the most current WRAMC special therapy bed SOP (Appendix A) and interviews with personnel in the DMAA, Department of Nursing, Directorate of Contracting, and Directorate of Resource Management.

The physician, in consultation with nursing staff on the ward or critical care unit, determines that the patient's condition warrants the use of a special therapy bed. The physician signs a written order in the patient's treatment record instructing the nursing staff to place the patient on the special therapy bed.

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The Head Nurse or Charge Nurse then completes a memorandum detailing the type of bed required (low air loss, air fluidized or kinetic therapy) and any additional equipment such as a patient helper (a trapeze bar to assist patient movement) or bed scale (see Appendix D). The attending physician signs the memorandum, obtains approval and signature of his or her clinical department chief and returns the completed memorandum to the nursing unit. The resident physician often delegates the task of obtaining a department chief's approval to either the nursing staff or administrators.

Ward staff deliver the completed memorandum to the Sixth Floor Central Receiving Office no later than 1600 hours, Monday through Friday for next day delivery of the bed. To ensure same day delivery of the special therapy bed, the memorandum must be delivered to this office no later than 1200 hours, Monday through Friday.

Once ward personnel deliver the completed memorandum to the Sixth Floor Central Receiving Office, the logistics technicians determine if an available WRAMC-owned bed will satisfy the requirement. If a WRAMC-owned bed is required, the Sixth Floor Central Receiving Office logistics technicians notify the

appropriate Unit Administrator of the availability of a WRAMC-owned bed. The UA then directs a logistics technician on that floor to pick up a set of 23 air cushions and two latex sheets from the Sixth Floor Central Receiving Office and obtain a bed frame from the storage area in Central Material Service (CMS).

The logistics technician assembles the WRAMC-owned bed and delivers it to the requesting ward. The nursing staff on the ward place the patient on the bed and adjust the air cushion pressures to suit the needs of the patient.

In the case where a WRAMC-owned bed is not available or not suited for the requirement, the Sixth Floor Central Receiving Office will prepare the Department of the Army (DA) Form 3953 - Purchase Request which details the specifications of the bed requirement. Logistics technicians from the Sixth Floor Central Receiving Office forward the completed purchase request to the Programming and Budget Division, Directorate of Resource Management for fund authorization. Following the authorization of funds, the purchase request is forwarded to the Directorate of Contracting who immediately calls the vendor to place the order.

The Sixth Floor Central Receiving Office maintains a file of all request forms by floor. When the logistics technician completes an order for a bed, he or she places the patient's name, location, type of rental bed, issue date, and contract expiration date on an erasable marker board mounted on the wall. This board measures approximately five feet wide by four feet high. The WRAMC owned beds are differentiated by serial numbers that are magnetically affixed to the board. The contract expiration date reminds the logistics technician to query the ward staff about the continued need for the bed at the end of the current contract period.

The Directorate of Contracting ensures same day delivery of a bed if the purchase request reaches their office prior to 1500 hours, Monday through Friday. If the purchase request arrives after 1500 hours, the earliest that a rental bed can be delivered is the next business day. Each special therapy bed vendor delivers, sets up, and maintains their own rental bed. The vendors also provide 24 hour a day service to WRAMC nursing staff.

The Directorate of Contracting completes a contract with the vendor for each individual bed rented

and assigns a purchase order number to the contract. This contract obligates WRAMC to pay for the service of a rental bed. The contract requires signature of the vendor representative that authorizes the contract with the government. The Contracting Officer often mails these contracts to the vendor representative for signature. The vendor representative then mails the contracts back to the WRAMC Contracting Office for processing. The initial rental period for each of these contracts is 14 days.

At the end of 14 days, the logistics technician from the Sixth Floor Central Receiving Office notifies the logistics technicians on the floors that have expired bed contracts. A logistics technician responsible for the ward with the expired bed contract telephones ward staff to determine if the patient still requires the special therapy bed. If the nursing staff state that the patient still requires the bed, the logistics technician notifies the Sixth Floor Central Receiving Office logistics technician. The Sixth Floor Central Receiving Office logistics technician then completes an extension memorandum requesting an additional rental period of 30 days and forwards it to the Directorate of Contracting.

Special Therapy Bed Management System

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Following the initiation of a contract for the rental of a special therapy bed, the Directorate of Contracting issues a Department of Defense (DD) Form 1155 - Receiving Report and sends it to the Sixth Floor Central Receiving Office where it is held until the patient is taken off the rental bed. When the rental agreement terminates, the Sixth Floor Central Receiving Office staff completes the Receiving Report and sends it to the Commercial Accounts Division, Finance and Accounting Office (FAO). In addition, the Directorate of Contracting modifies the contract to reflect the actual funds needed to cover the rental of the beds. If the contract or contract extension exceeds the actual number of rented bed days, then the funds must be deobligated through the Directorate of Resource Management.

The Commercial Accounts Division requires two other documents before initiating payment to the bed vendors. The vendor must send an invoice covering the entire time of the rental agreement and the Directorate of Contracting must submit a copy of the contract with any modifications or extensions. The Commercial Accounts Division marries these three documents (Receiving Report, vendor invoice, and contract with

modifications) together and initiates the process of disbursing funds to the appropriate vendor.

When a WRAMC-owned special therapy bed is no longer required, the ward staff notify the Sixth Floor Central Receiving Office. Logistics technicians from this office retrieve the bed and remove the air cushions and sheets. The soiled air cushions and sheets are sent to the WRAMC Linen Facility for cleaning. The logistics technician also notifies the Housekeeping Department who tasks a housekeeper to clean the bed frame. The logistics technician then returns the bed frame to the CMS storage area.

Special Therapy Bed Telephone Survey

Data collection for this case analysis included telephonic discussions with the nursing or administrative personnel responsible for managing the use of special therapy beds at eight large hospitals. Selected for the survey were five local civilian facilities, two local federal facilities, and an Army medical center located in the southwestern United States. The survey consisted of 27 questions relating to both the clinical decision making process and the management of the special therapy bed system. The hospitals cited either enterostomal nurses, quality

assurance nurses, clinical nurse specialists, or nurse methods analysts as their special therapy bed experts. For the purposes of this study, the eight facilities were identified by the following descriptions:

Hospital A - a 907 bed private, not-for-profit teaching hospital located in Washington D.C.

Hospital B - a 455 bed private, not-for-profit teaching hospital located in Washington D.C.

Hospital C - a 535 bed private, not-for-profit teaching hospital located in Washington D.C.

Hospital D - a 442 bed private, not-for-profit teaching hospital located in Silver Spring, MD.

Hospital E - a 501 bed private, not-for-profit teaching hospital located in Washington D.C.

Hospital F - a 399 bed military teaching hospital located in Bethesda, MD.

Hospital G - a 710 bed federal teaching hospital located in Washington D.C. (This 710 bed total includes a 120 bed skilled nursing facility).

Hospital H - a 650 bed Army teaching hospital located in the southwestern United States.

The following is a summary of the data collected from the telephone survey. The survey lists the 15 clinical questions first, followed by the 12 management

questions.

Clinical questions. Question 1 - Does a written policy exist to cover the management of special therapy beds at your facility? Hospitals A, B, D, and H have a written policy covering the use of these beds. The policy at Hospital C is that anyone can get a bed just by calling the enterostomal nurse. Hospitals E, F, and G do not have a written policy.

Question 2 - Are clinical indicators for bed use in place? Hospital A uses a decision tree model and has reduced its special therapy bed use rate from 40 per day down to 20 to 25 per day. Hospital D has general guidelines, but would not describe them in detail. Hospitals B, E, and H have clear guidelines detailed in nursing SOPs and based on skin assessments. Hospitals F and G determine the type of bed to use based on diagnosis, procedures and expected length of stay. Hospital C has no guidelines.

Question 3 - How were these indicators developed? Hospitals A and D developed their indicators through their skin care committees, F through its Quality Assurance Committee, and E through its Products Committee. A collaborative effort of surgeons, an intensivist (critical care physician), and the nursing

service developed indicators at Hospital B. Hospital G developed criteria through word of mouth.

Question 4 - Who makes the decision to order a bed? All the respondent hospitals rely on a collaboration between the medical and nursing staffs when deciding to order a special therapy bed. At one time Hospital B allowed nurses to order the beds independent of a consultation with physicians. This resulted in an overuse of these beds and this hospital has since stopped the practice.

Question 5 - Do you need a physician's order to obtain a bed? Once the bed is ordered, who places the call to the vendor? All eight of the hospitals require a written order in the patient's treatment record before placing an order. Hospitals A and B allow their Nursing Services to notify vendors of bed requirements. Medical supply divisions at Hospitals C, D, E, and G place orders. Hospital F has their contracting division place the call while Hospital H allows contracting representatives from the Department of Surgery and Medicine to place the orders.

Question 6 - Who evaluates the patients condition related to the continued need for a special therapy bed? At Hospitals A and D it is the nursing staff,

Hospital C uses a physician, a nurse, and a vendor representative making rounds, Hospital F relies on the medical staff and Hospitals B, E, G, and H do not have evaluation policies in place.

Question 7 - How often are these evaluations conducted? Hospitals A and C are weekly, F is daily during medical staff rounds, and D has no routine evaluation schedule.

Question 8 - Do patients get taken off special therapy beds and placed on mattress overlays or mattress replacements as their condition improves? All hospitals except G and H make an effort to use mattress replacements or overlays as their patients condition improves.

Question 9 - Do vendors deliver and set up the beds on the units and then remove them when they are no longer needed? All hospitals responded yes.

Question 10 - What is the role of Nursing Service in special therapy bed management? Hospital A has a Nursing Systems Office that manages the entire program. They process all orders, notify vendors, and send information to the billing department. The ward nurses consult with physicians on the selection of a bed. Hospital C has the enterostomal nurse manage the

program. She is the exclusive contact with the vendors, is involved in the negotiation of prices, and determines which bed types and vendors the hospital will use. Nurses at Hospitals B, D, E, F, G, and H only consult with the medical staff on the appropriate bed to use.

Question 11 - Do clinical nurse specialists have input into the decisions placing patients on special therapy beds? They are involved in the process at Hospitals A, B, D, and G only.

Question 12 - Does the enterostomal nurse have a role in the bed management system? They serve a big role at Hospital C, only a consulting role at Hospitals D and E, and no role at the remaining hospitals.

Question 13 - Does a policy on skin care or skin care management exist and is it tied to the use of special therapy beds? All hospitals have a skin care policies but only Hospitals A, C, D, and F have these policies tied to the use of special therapy beds.

Question 14 - Does the Utilization Review Committee play a role in monitoring the use of these beds? None of the hospitals reported a role of the Utilization Review committee in the management of bed use, but Hospital H has a proposal for such a review

process.

Question 15 - What educational activities are offered to the hospital staff (to include physicians) on the use of special therapy beds and other pressure reducing devices? Bed vendors provide educational opportunities to all hospitals in the survey. All hospitals report that these vendor inservices are given to the nursing staff. Hospital C offers an annual orientation program on the use of these beds. Hospitals A, B, C, E, and F report that physicians (usually medical students and interns) receive occasional training on the use of the beds.

Management questions. Question 1 - What types of special therapy beds are utilized by your facility? Hospital E uses predominantly low air loss beds, Hospitals A, B, and G use air fluidized and low air loss and Hospitals C, D, F, and H use all types.

Question 2 - Do you use mattress overlays or mattress replacements as first line pressure reducing devices? All hospitals use these devices.

Question 3 - Which special therapy bed vendors do you deal with? Hospitals A, B, C, and D deal predominantly with Support Systems International (SSI) based in Charleston, SC. Hospital E receives its beds

exclusively from Kinetic Concepts (KCI) based in San Antonio, TX. Hospitals F, G, and H use both vendors for beds.

Question 4 - Do you own any special therapy beds or do you solely lease them under contract? Hospitals A, B, C, D, and E all rent their beds. Personnel at Hospital F were unsure if they owned any beds.

Hospital G owns three low air loss beds and Hospital H owns one low air loss bed and one kinetic therapy bed.

Question 5 - If you own any special therapy beds, who handles the maintenance and support? Hospital G utilizes their own preventive maintenance shop while Hospital H has a maintenance contract with a vendor at \$3800 per year for both of their beds.

Question 6 - Do you track the total number of special therapy bed days used at your facility? Hospitals A, B, C, and D track bed days in daily logs for billing purposes. The Department of Surgery at Hospital H also keeps a record of bed days used within its department.

Question 7 - What is the average number of beds in use at any one time? Hospitals A, B, C, and D average between 15 and 20 beds per day, Hospital G about 10, Hospital E between 7 and 8, Hospital F between 3 and 4

and Hospital H did not have an accurate answer.

Question 8 - Do you have a contract with your vendors? Hospitals A, B, C, D, and E all have separate contracts with vendors. Due to their governmental affiliations, Hospitals F, G, and H utilize the Veterans Administration (VA) contract when renting beds.

Question 9 - How would you rate the quality of the contract? (i.e., the responsiveness of the vendor, maintenance support, inservicing, delivery and setup, bed removal, etc.) All hospitals gave positive feedback on inservices and responsiveness from vendors. None of the hospitals reported problems with delivery, set up, or removal of the beds. Hospital B described occasions where one vendor gave inaccurate price quotes and added cleaning fees after the establishment of the contract.

Question 10 - What is the cost per day for leased beds? To avoid revealing the negotiated prices for each facility, the per day rental price ranges for each bed type are given. Low air loss beds ranged in price from \$32.00 to \$55.00 per day, air fluidized from \$54.00 to \$65.00 per day and kinetic therapy beds from \$85.00 to \$145.00 per day. The average price for obese

beds was \$75.00 per day. Mattress replacements cost approximately \$30.00 per day.

Question 11 - How are aspects of billing the hospital handled? Hospitals A, B, C, and D receive vendor invoices, validate the actual use of beds, and make payment to the vendors. Hospital E has a blanket purchase agreement with the vendors. The vendors bill the hospital for the total number of bed days accumulated during any one 30 day billing cycle. The vendors bill the federal hospitals, F, G, and H on a monthly basis.

Question 12 - Estimate how many administrative man hours are spent on your special therapy bed management system. Hospital A estimated approximately four hours per day; Hospitals C and E, one half hour per day; Hospital G, one quarter hour per day; and Hospital H, two hours at the end of the month and one quarter hour per day.

Review of Contracting records

The Directorate of Contracting maintains individual files for each special therapy bed contract. The files contain copies of original purchase orders, vendor invoices (if available), and all contract modifications. Only the records of one vendor, Kinetic

Concepts Inc., were complete enough to collect data on total bed days used at WRAMC from June 1986 to February 1991. The number of rental contracts completed during this time period totaled 176. Table 1 summarizes the bed day totals for these contracts.

Review of Programming and Budget Records

The Programming and Budget Division, Directorate of Resource Management maintains a ledger of all funds committed to contracted equipment and supplies during the year. Programming and Budget personnel enter the committed fund citations into the ledger in chronological order and differentiate them by floor (i.e., 4th Floor, 5th Floor, 6th Floor, etc.). The listing provides a record of obligated and deobligated funds used for all contracted equipment to include special therapy beds. Table 2 summarizes the results of a review of the committed fund records for special therapy bed rentals over the past five and one half fiscal years (FY).

WRAMC owns 12 low air loss beds and one kinetic therapy bed. The WRAMC Property Book maintained by the Property Management Division, Directorate of Logistics, lists the purchase prices for the WRAMC-owned special therapy beds. In 1988, WRAMC purchased five low air

Table 1

Cumulative Special Therapy Bed Days, Kinetic Concepts,
June 1986 to February 1991

Bed Days Used	Cases (n = 176)
1 - 5	26
6 - 10	28
11 - 15	35 *
<u>* (21/35 were for 14 days; 3/35 were for 15 days)</u>	
16 - 20	19
21 - 25	18
<u>26 - 30</u>	<u>8</u>
31 - 35	4
36 - 40	5
41 - 45	5
46 - 50	6
51 - 55	4
<u>56 - 60</u>	<u>7</u>
61 - 65	1
66 - 70	1
71 - 75	2
76 - 80	2

(Table continues)

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81 - 85	1
86 - 90	1
91 - 95	0
96 - 100	1
> 100	2

Table 2

Funds Committed to Special Therapy Bed Rentals, October 1985 to March 1991

Committed Funds (dollars)						
Floor	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91
4	104,467	41,521	63,001	71,176	139,103	70,869
5	46,781	28,317	54,658	16,704	38,392	13,637
6	18,695	17,036	57,196	30,124	36,727	3,973
7	94,752	37,205	46,009	67,359	102,114	19,540
Total	264,695	124,079	220,864	185,363	316,336	108,019

Note. FY 91 figures are through March 1991 only.

loss beds at a cost of \$29,500.00 each. The three low air loss beds purchased in 1989 were \$19,105.00 each and the four purchased in 1990 were \$14,355.00 each. Total expenditures on the purchase of low air loss special therapy beds at WRAMC has been \$262,235.00. The original purchase price for the kinetic therapy bed was not available in any of the Property Book documentation.

At the start of FY 91, the Directorate of Resource Management assigned the rental of special therapy beds its own Appropriation Code (APC). Programming and Budget personnel use this code to track the total financial expenditures for a given activity or service. The special therapy bed APC appears on all purchase requests generated by the Sixth Floor Central Receiving Office. The use of this new APC will provide an accurate accounting of total special therapy bed expenditures for a given fiscal year.

Additional Interviews

Medical maintenance. An interview with a supervisor within the Maintenance Division, Directorate of Logistics provided valuable information on the care of the WRAMC-owned special therapy beds. This supervisor discussed how the Medical Maintenance Branch

assigns each bed a Medical Maintenance Control Number (MMCN). The MMCN identifies each piece of property within the AMEDD Property Accountability System (AMEDDPAS). The AMEDDPAS is a centralized computer system located at Health Services Command, Fort Sam Houston, Texas. This computer system generates a monthly listing of all equipment that requires maintenance for each medical treatment facility.

The preventive maintenance on the special therapy beds is scheduled to occur every six months. This maintenance includes lubricating all moving parts, changing filters, and tightening clamps. There are some computer components on the WRAMC-owned beds but they are modular and easy to replace if parts are available. There is no SOP for the maintenance beyond that which accompanies the owners' manual.

The Medical Maintenance Branch conducts preventive maintenance on all WRAMC-owned special therapy beds. Medical Maintenance personnel notify the Sixth Floor Central Receiving Office to arrange for the scheduled special therapy bed preventive maintenance. When the bed is available, the medical maintenance technicians go to the storage area and complete the service.

Chief Resident, Department of Medicine. This physician discussed his impressions of how the current special therapy program is functioning. There are no clear guidelines or criteria for the medical staff when considering use of a special therapy bed. He suggested that the reason the physicians do not rely on clinical indicators and criteria for placing patients on these beds is that physicians know that the technology is effective and want it as part of their state of the art medical practice.

At WRAMC, a large teaching facility, the direct care of most of the patients is done by residents, under the supervision of medical staff. Medical residents, either on their own or after consultation with senior staff physicians, make the decisions on the type of pressure relieving device to use for their patients. The Chief Resident agreed that the clinical decision making process usually consists of nursing staff recommendations to residents as to which patients require special therapy beds. This is followed by the resident physician writing the order in the patient's treatment record. The Chief Resident stated that he relies on his best clinical judgement when determining which patients require specialty bed therapy. This

judgement includes evaluating the patient's current condition and their potential for extended immobility.

When asked about controlling costs in relation to the ordering of pressure relieving devices, this physician bluntly stated that there is no consideration of costs by any of the resident physicians in this teaching hospital. Also, there are no conscious efforts by physicians to move patients to the less costly mattress overlays or replacements as their clinical condition improves.

Chapter IV - Discussion

The use of special therapy beds is well established within health care as an accepted treatment modality for cases of compromised skin integrity, spinal trauma, and respiratory dysfunction. The increased use of these beds at WRAMC parallels that of other health care facilities. This use will likely continue to escalate due to the growing frail elderly population that will occupy inpatient acute care facilities in the next several decades. A primary cause of the rising number of acute care bed days in the United States is the continued explosion of health care technology. Special therapy beds and other pressure relieving devices will continue to improve and become an even more effective treatment modality for acute care patients with compromised skin integrity.

It is evident that since 1985 WRAMC has struggled to control the escalating use and high financial cost of providing special therapy bed technology to its inpatients. The numerous memorandums, SOPs, regulations, committee meetings, and decision papers have all been attempts at achieving management control over this piece of health care technology.

WRAMC is not alone in its quest for management

control over this technology. Many other hospitals in the survey did not have clear guidelines for the use of these beds, did not accurately track the use of the beds, and did not consistently reevaluate patients for their continued requirement of high cost bed technology.

The management control of these beds at WRAMC has been the responsibility of the DMAA. The mission of the DMAA is to provide direct support to clinical activities within the medical center (Department of the Army, Headquarters, Walter Reed Army Medical Center, 1985). This usually means responding to the numerous requests of impatient clinicians quickly and without question. In the heat of the moment, administrators will rapidly respond to a demanding physician or nurse but often at expense of the efficient use of limited resources. Overpowering influences of medical staff and clinical departments within this teaching hospital have contributed to the mismanagement of WRAMC special therapy beds. The inept management of special therapy beds is evident in the following example.

On a randomly selected day, a Clinical Nurse Specialist and the Sixth Floor Associate Administrator accompanied the researcher on a walking tour through

WRAMC looking for special therapy beds and other pressure relieving devices in use. The Sixth Floor Central Receiving Office tally board listed seven of the WRAMC-owned beds in use, five in storage, and no rental beds in use within the medical center. Of the seven patients listed on the DMAA board, five were correct. Nursing staff had kept the remaining two beds in operation on the floor but placed different patients on them without notifying the Sixth Floor Central Receiving Office. Four of the remaining unused WRAMC-owned beds were in CMS storage while the whereabouts of the fifth was unknown.

The most interesting finding was the appearance of three rented special therapy beds and two rented mattress replacements on three different WRAMC wards. The Sixth Floor Central Receiving Office had no record of these rentals. Logistics technicians on the Fourth and Fifth floors were bypassing the Sixth Floor Central Receiving Office when ordering rental beds and mattress replacements.

When the Fourth and Fifth Floor Central Receiving Offices received a specific request for a WRAMC-owned bed, the logistics technician would call the Sixth Floor Central Receiving Office to obtain the bed. If

the request were for any other type of bed or mattress, the logistics technician would complete the purchase request and forward it to the Programming and Budget Office, without first taking it to the Sixth Floor Central Receiving Office. The Contracting Office would subsequently receive the purchase request and place the special therapy bed order. The lack of centralized management control became very clear to the Associate Administrator this day.

In all fairness to the DMAA, the failure of the current special therapy bed management system may in fact be due to weaknesses inherent within the system. Requests for special therapy beds come to the Sixth Floor Central Receiving Office from multiple inpatient wards. The health care providers that complete the requests for these beds likely have very different levels of clinical expertise concerning the use of pressure relieving devices. Ward personnel may not be aware of the most current pressure relieving trends and techniques available to their patients. This leads to confusion as to the most appropriate device for patients.

Administrative personnel attempt to manage this confusion by asking clinicians to clearly delineate

their special therapy bed requirements and then proceed to support the requests. This process becomes frustrating to the administrative personnel when clinicians are uncertain of their own requirements. These unclear logistical requirements can generate conflict between the administrative support personnel and clinicians. Frustration with the entire system builds with each interaction between clinician and administrator.

The hospital survey revealed that four of the eight hospitals place orders for beds through their material management divisions. In describing a successful bed management system in one hospital, Peoples et al. (1990) noted that the control for ordering beds was the responsibility of the material management office. Placing centralized management control of special therapy beds within material management divisions appears to be a logical conclusion considering their mission to provide "management and control of supplies and equipment from acquisition to disposition" (Lachner & Neaman, 1979, p. 2).

The reorganization of the DMAA and the transfer of the responsibility for managing the WRAMC special therapy bed management system to the newly forming

Hospital Logistics Division will enhance management control. Obtaining a special therapy bed for an inpatient at WRAMC, a true logistics function, has finally been given to the directorate that can best understand the process and manage the system.

While management control for ordering and tracking of special therapy beds at WRAMC may soon lie with the Directorate of Logistics, it is still the senior management, both clinical and administrative, that must be responsible for total management control and develop the organizational philosophy toward the use of this expensive new technology. In order to make informed, sound decisions on the acquisition of new equipment, senior management, both clinical and administrative, must become knowledgeable of the application of new technologies within our resource constrained health care environment.

The civilian institutions in the survey all reported that they did not own special therapy beds. The reasons cited most often were the high cost of buying the beds and a reimbursement mechanism that is different from WRAMC's. The civilian hospitals are able to pass the cost of the rented beds on to private insurance companies or to Medicare. WRAMC operates

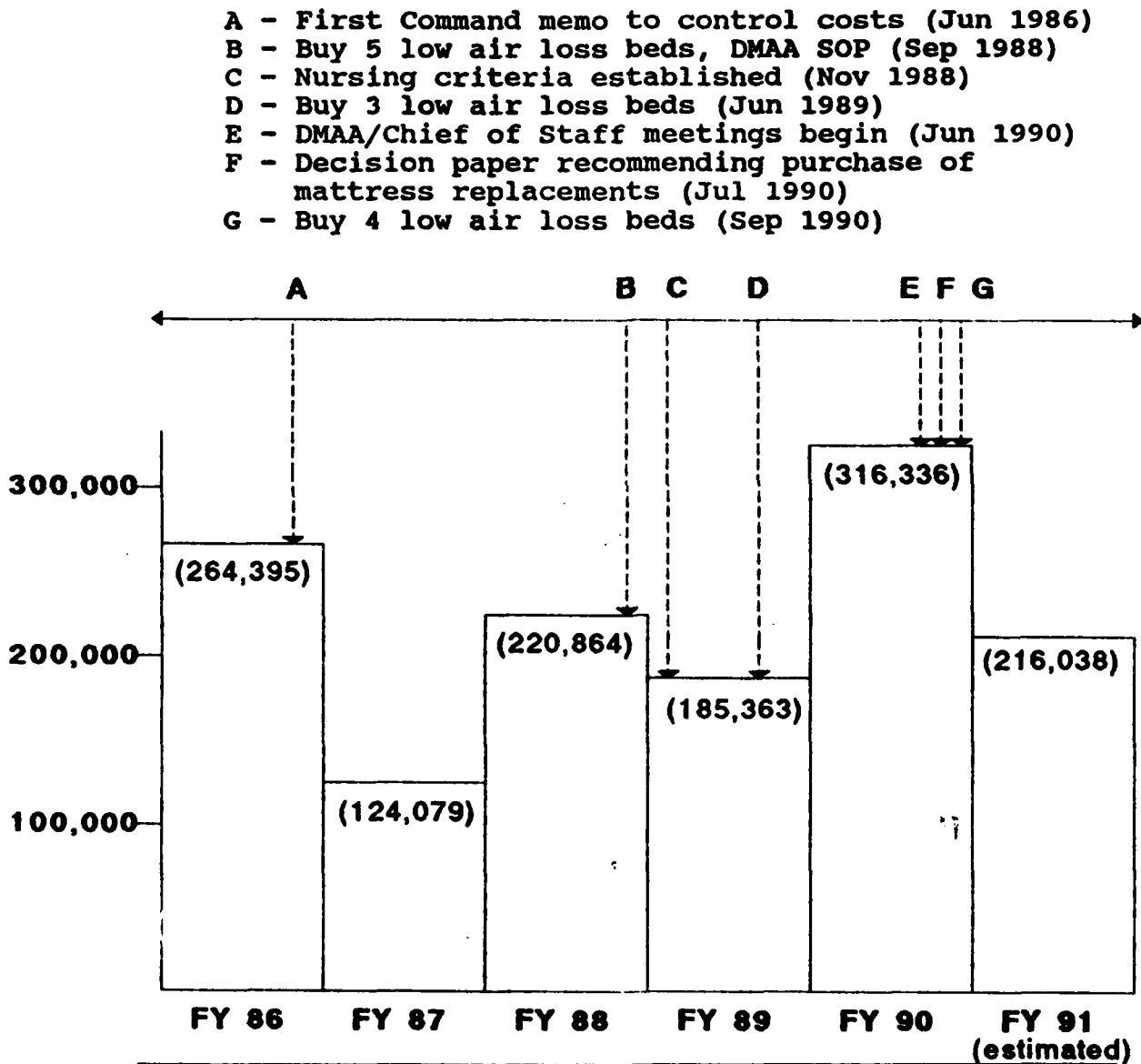
within a fiscal environment that is similar to a prospective fee schedule that is based on inpatient workload figures. Funding from higher headquarters is based on increases or decreases in workload and changes in mission. WRAMC recognized an increase in its use of special therapy beds and saw an opportunity to save contract rental monies through direct purchase of these beds.

WRAMC has purchased a total of 13 special therapy beds and anticipates buying four mattress replacements to supplement its inventory of pressure relieving devices. The management decisions to purchase special therapy beds appear reasonable under the historical circumstances. However, senior management should begin to question the number and type of special therapy beds purchased in the future due to the existence of low cost alternatives such as mattress replacements. This underlines the problems associated with purchasing new technology that may still be evolving.

Review of financial data from the Programming and Budget Office yields information leading to several interesting conclusions. A graphic representation of the yearly financial outlays for special therapy bed rentals (Figure 1) reveals a relatively consistent

Figure 1

Funds Committed to Special Therapy Bed Rentals, October 1985 to March 1991 (Significant events noted)



Note. Data obtained from the Programming and Budget Division, Directorate of Resource Management, WRAMC.

pattern. Fiscal years with large dollar outlays alternate with years of small outlays. At first glance, it might appear difficult to determine why the financial outlays for special therapy beds did not consistently increase with increased bed use at WRAMC. However, when significant events in the history of special therapy beds at WRAMC are superimposed over the graph, this pattern becomes easier to discern (Figure 1).

The large outlays during FY 86 were due to the introduction of an expensive new technology. The kinetic therapy and air fluidized beds that WRAMC rented in 1986 were only recently introduced into health care and were quite expensive (over \$100 per day). The first cost control mechanism (Event A, June 1986) was a memorandum from the Deputy Commander for Clinical Services asking clinicians to better evaluate their patients before placing them on these beds.

The senior management interest in controlling the costs associated with these beds appears to have been enough stimulus to ease the skyrocketing financial outlays for special therapy beds. FY 87 bed expenditures were significantly lower. Contracting records reveal that rentals for kinetic therapy beds

decreased dramatically and rentals of air fluidized beds declined as well.

Low air loss beds made their appearance at WRAMC during FY 88 and contributed to the increase in rental expenditures. Rental expenditures in FY 88 again escalated but remained lower than the FY 86 total. The purchase of five special therapy beds (Event B, September 1988) raised the FY 88 special therapy bed expenditure total to \$368,364. The year end purchase of these beds was an attempt to reduce future rental costs.

The publication of the DMAA Kinair Therapy Bed SOP (Appendix A) and the first Department of Nursing guidelines on use of special therapy beds (Appendix B) followed the purchase of these beds. Again, the management interest and use of clinical guidelines resulted in a decrease in the financial outlays for special therapy beds in FY 89.

The three low air loss beds purchased in June of 1989 (Event D) added \$57,315 to the FY 89 expenditures, bringing the total to \$242,678. Even with the purchase of these three beds, FY 89 total expenditures were significantly lower than the FY 88 total of \$368,364.

Of interest is the dramatic increase in special

therapy bed expenditures during FY 90. Special therapy bed rentals alone totaled \$316,336. Again, management noted this increase in special therapy bed expenditures and responded late in the fiscal year with Chief of Staff meetings (Event E, June 1990), a decision paper (Event F, July 1990), and the purchase of four low air loss beds with year end monies (Event G, September 1990). Expenditures on special therapy beds in FY 90, to include the purchase of four beds at year end, yielded the largest yearly total to date (\$373,756).

Committed funds for special therapy bed rentals for the first six months of FY 91 were \$108,019. If the FY 91 expenditures continue at their current pace, the estimated yearly total will be approximately \$216,000 which is significantly lower than \$373,756 spent in FY 90.

One explanation for the consistent pattern of large then small yearly expenditures on special therapy beds is that management recognized the rising expenditures for these beds late in the fiscal year and then reacted by issuing memorandums, holding meetings, and even purchasing several of the beds in an effort to regain control over costs. The problem with this technique is that management fails to monitor its own

control mechanisms closely and simply reacts to a report of escalating bed costs. This reactive management style offers only temporary solutions to this type of problem.

A special therapy bed management system with appropriate management control mechanisms in place could yield a graph very different from the one represented in Figure 1. Through a programmatic planning process that includes the continual assessment of the clinical needs of the medical center and frequent evaluation of technologic changes, we could expect to see a smoother, more horizontal curve.

Gradual increases in yearly rental expenditures would result from the controlled increase in the number of special therapy devices as more and more critically ill immobile patients receive this therapy. WRAMC could easily justify any small increases in special therapy bed expenditures if a greater number of patients receive the benefits of special therapy devices. The most meaningful benefit to WRAMC patients would be the expected shorter hospital lengths of stay resulting from the effective use of pressure relieving devices.

The most important element involved in the control

of special therapy bed expenditures is a conscious effort by clinical and administrative management to assess the changing needs of the military beneficiary patient population. Senior management must then match the needs of this patient population with the existing and evolving special therapy bed technology.

Management control of a system includes managing the many unique processes within the system. The current special therapy bed management system at WRAMC is composed of many unique processes and involves the interplay of multiple administrative and clinical departments. Critical analysis of these processes could yield valuable information regarding problems associated with the management control of special therapy bed use at WRAMC. Also, a review of the hospital survey results encompassing clinical and managerial issues of special therapy bed systems might generate solutions to procedural problems.

The decision to place a patient onto a pressure relieving device is often a collaborative one between physicians and clinical nurses. All surveyed hospitals and WRAMC describe a collaborative decision making process where nursing staff are often the first to initiate discussions on the use of special therapy

beds. This is likely due to the strong emphasis placed on skin care within the profession of nursing. As a result, nurses have become the clinical experts on skin care in most facilities. This expertise may lie with ward nurses or be under the purview of the enterostomal nurses, infection control nurses, quality assurance nurses, or clinical nurse specialists. Conversely, physicians, who tend to focus on disease entities and physiologic processes, rely heavily on nursing staff to ensure proper skin management and patient comfort.

The requirement for a written physician order in a treatment record is valid considering quality of care and standard of practice issues. The WRAMC process of requiring the clinical department chief's signature on the request form was likely a mechanism inserted in the system to keep the separate departments informed of the supply budget dollars going toward special therapy beds. Physician, nurse, and administrator time lost tracking down a clinical department chief to sign a request form is alone enough reason to eliminate this step.

Several hospitals in the survey are considering the development of guidelines governing the periodic evaluation of a patient's continued need for a special

therapy bed. The policy of WRAMC logistics technicians telephoning the ward staff after an initial 14 day period and asking if the patient still requires a bed is not the most efficient means of control. The logistics technician may not even talk to a patient care provider but only speak with a ward clerk or secretary when calling to the ward. Table 1 shows the result of this method as a large number of bed rentals over the past have lasted 14 days. The next time that a logistics technician calls to the ward evaluating a patient's continued need for a bed is after an additional 30 days of bed use. This process continues at 30 day intervals until the patient is taken off the bed. The problem occurs in determining how many of those 14, 44, or 74 day rentals could have been terminated earlier simply by more closely evaluating the patient's condition and continued need for a special therapy bed.

Clinicians must establish a schedule of periodic skin condition evaluations for patients on special therapy beds. When a patient's skin condition improves such that he or she may be transferred off the special therapy bed, the bed should be discontinued and the patient placed on the appropriate pressure relief

device. It is recommended that periodic evaluations be done every two to seven days while the patient is on the bed (Peoples et al., 1990; Lovell & Anderson, 1990).

Based on multiple discussions with WRAMC staff and the results of the walking tour of beds in use, the problem of tracking WRAMC special therapy beds became apparent. While an erasable marker board is convenient to note changes in bed status, the information written on the board is limited and once erased, is lost forever. A more permanent record of all cases of special therapy bed use at WRAMC inclusive of information such as patient demographics, locations, issue dates, clinical indicators, and financial data would benefit the organization through improved management control of resources and the development of a clinical database.

One of the main concerns with the current special therapy bed management system at WRAMC involves problems in making timely payments to bed vendors. The practice of issuing individual contracts for each bed rental has led to a large amount of paperwork for the Contracting Office and numerous financial accounting problems. According to a WRAMC Contracting Officer,

these problems result from the WRAMC policy of issuing bed contracts initially for periods of 14 days and extending them in increments of 30 days as needed. Special therapy bed vendors in this area bill their clients on a 30 day cycle. Vendors issue invoices every thirty days regardless of whether a patient is still using their bed or not. Vendors charge WRAMC for the total number of bed days used on each contract during the 30 day period. By using individual contracts, WRAMC does not begin to make payment to the vendors until after staff determine that the need for a special therapy bed no longer exists and remove the patient from the bed.

These differences in accounting systems have led to large special therapy bed accounts payable for WRAMC over the last several years. During the summer of 1990 the Directorate of Resource Management attempted to reconcile much of the outstanding debt. In fact, a \$35,000 account payable with one of the vendors was reduced to \$7,000 over a period of several months. However, recently another vendor has issued their own record of past due accounts and the Directorate of Contracting is currently struggling to reconcile this account.

The contracting data in Table 1 that lists cumulative totals of bed days for 176 rentals by one vendor over a six year period interestingly suggests a solution to the vendor billing problems. Analysis of this data reveals that at 30 and 60 day increments, significant changes occur in rental patterns. While only 49% (86/176) of the rental contracts were for 14 days or less, 76% (134/176) of the rentals terminate at 30 days and 94% (165/176) terminate at 60 days. The extension of a rental contract involves the completion of paperwork in the Sixth Floor Central Receiving Office and at Contracting. Using these figures, 51% of all bed rentals required the completion of additional paperwork during the life of the contract.

The Sixth Floor Central Receiving Office and the Directorate of Contracting both cited the completion of excessive paperwork as a problem with the current system. Utilizing a 30 day initial rental period alone would decrease the paperwork by over half (51%ⁱ to 24%). According to Contracting personnel, the implementation of 30 day incremental periods for the rental contracts on special therapy beds could also solve many of the problems associated with vendor billing. Matching the billing cycle of vendors to the WRAMC contract schedule

has been shown to be effective in managing payments.

One vendor, Kinetic Concepts Inc., changed its billing cycle to an initial 14 day period followed by increments of 30 days in an effort to accommodate WRAMC. This change has effectively reduced this vendor's overdue balance. Such is not the case for the other vendors who continue to have large overdue balances on special therapy beds rented by WRAMC.

The Chief, Programming and Budget Division, Directorate of Resource Management has stated that the 30 day periods of obligated funds for rental beds would be acceptable. His main concern was that the beds would be rented for 30 day periods without any evaluation of continued need during that initial period. The change to 30 day rental periods would only be effective if supported by a policy of frequent evaluations of patients utilizing special therapy beds.

The Directorate of Contracting staff expressed concern over the procurement of special therapy beds after normal duty hours. Historically, special therapy beds were ordered only during normal duty hours and always by Directorate of Contracting personnel. Several command memorandums and SOPs discussed how ordering a special therapy bed was not an emergency and

could wait until the next business day. In the past, nursing staff, DMAA evening staff, and the Administrative Officer of the Day have ordered special therapy beds after duty hours.

This practice disturbs the Contracting Office because the ordering of equipment without the completion of the appropriate documentation is illegal. According to the Federal Acquisition Regulation (FAR), a person initiating the rental of equipment for the government under contract must be an authorized representative of the government, that is, a contracting officer or contracting officer representative (United States Army Logistics Management College, 1988). This illegal practice of unauthorized procurement also generates its share of burdensome paperwork such as the memorandums routed to the WRAMC Chief of Staff for review and approval.

The complexity of this health care organization suggests that the problems confronting the current WRAMC special therapy bed management system are unmanageable. The inability to track special therapy bed use and the uncontrolled costs associated with using the beds are problems that plague many hospitals. However, these problems are not insurmountable for any

hospital, including an organization as complex as WRAMC. The critical analysis of the current WRAMC system, historical review of financial records and evaluation of the hospital telephone survey results suggest that positive changes within the current system are possible.

Chapter V - Conclusions and Recommendations

This research has focused on the management of special therapy beds at Walter Reed Army Medical Center. The use of these beds at WRAMC has historically been inefficient, costly, and poorly tracked. The reorganization of the DMAA, coupled with the evolving role of the Hospital Logistics Division provides this organization a unique opportunity to introduce effective change within the current special therapy bed management system.

The most important proposed change to the special therapy bed management system at WRAMC is to include a clinical expert in the special therapy bed decision making process. This clinical expert must be well versed in skin care prevention and treatment, knowledgeable of the latest in pressure relieving technology, and available to consult on each patient that may require such technology.

At WRAMC, the clinical staff best suited for this role are the clinical nurse specialists. There are currently three Army Nurse Corps officers assigned as clinical nurse specialists at WRAMC. These three nurses have graduate level nursing degrees as well as the clinical background and experiential knowledge to

function as clinical experts. However, they must be recognized as skin care experts and receive full support from all the clinical departments.

The introduction a single clinical expert with ultimate responsibility for clarifying special therapy bed requirements should ease the frustration felt by administrative components of the system. Clear guidance from clinicians as to the type of special therapy bed required will allow the Hospital Logistics Division to concentrate on it's mission of providing logistical support in a timely fashion. Prior to issuing their requests for special therapy beds, clinicians must first resolve any conflicts surrounding the clinical appropriateness of these pressure relieving devices.

Essential to the success of this system is the linkage between the clinical nurse specialists and the Hospital Logistics Division. They must work together to determine the most effective pressure relieving therapy for patients at WRAMC. Continual clear communication between these two essential components of the system can significantly enhance its operation and allow for the efficient management of limited financial resources.

An effective special therapy bed management system must permit clinical nurse specialists to consult with medical and nursing staff on the subject of skin care as needed. Following consultation with the clinical nurse specialists, ward nursing staff will complete the memorandum requesting the agreed upon pressure relieving device. The physician must enter an order for a special therapy bed into the patient's treatment record. The only signature required on the memorandum should be that of the clinical nurse specialist. The written order of the physician and the signature of the clinical nurse specialist on the request form confirms that the physicians and nurses on the ward have consulted with the skin care experts and have determined the most appropriate pressure relieving device for their patient.

The role of the clinical nurse specialist in this system is not limited solely to the initial consultations. These nurses must be committed to evaluate patients placed on special therapy beds every two to seven days. The clinical nurse specialists will determine the frequency of the patient evaluations. These nurses will use accepted clinical indicators to evaluate each patient's need for continued use of their

current pressure relieving device or possible transfer of the patient to another form of therapy. Assessments based on quantifiable instruments such as the Braden scale would be useful in documenting changes in a patient's skin status and serve to validate the use of pressure relieving devices at WRAMC.

A key component of the special therapy bed management system is an active educational program aimed at instructing all clinical users on various aspects of special therapy beds. All the surveyed hospitals and WRAMC rely on vendor sponsored educational opportunities to furnish their staff nurses with instruction on special therapy beds. The same educational opportunities are available to physicians but their attendance is often poor.

It is proposed that the clinical nurse specialists develop an internal educational program to supplement the educational offerings of the bed vendors. The WRAMC nursing educational program would focus on clinical indicators which determine placement of a patient onto a bed. In addition to a review of the clinical aspects of pressure relieving devices, the educational programs must teach the staff nurses and physicians to become cognizant of the financial

implications of utilizing the expensive special therapy beds. This educational opportunity should be a part of all clinical staff orientation programs and an annual requirement for nurses and medical residents.

It is logical for the staff nurses on the wards and in the critical care units to be the targets of this type of training. These nurses are often the health care providers that initiate plans for the use of pressure relieving devices and collaborate with the physicians during the decision making process. Physicians and nurses understand the benefits of applying the most appropriate therapy to their patients but must begin to realize that every technologic therapeutic intervention incurs a cost that is borne by the entire organization.

Following the reorganization of the DMAA, the Hospital Logistics Division will assume responsibility for management of the special therapy beds at WRAMC. The HLD will inherit the problems of tracking the use of these beds within WRAMC and managing special therapy bed rental costs. The successful management of these two issues could be facilitated by the development and use of a more permanent record of WRAMC's special therapy bed use. A permanent record of special therapy

bed use could be achieved through the implementation of a computerized database system. Records of each rental and use of a WRAMC-owned special therapy bed would be recorded and stored for future reference and analysis. The database would offer an effective tracking mechanism to the administrative and clinical personnel involved in managing the use of the beds.

This suggestion was presented to a software programmer at the Directorate of Information Management. Utilizing a common database software package, the programmer developed a special therapy bed inventory management system. The programmer considered inputs from the Sixth Floor Unit Administrator responsible for the bed program, the clinical nurse specialists, and the researcher.

The database allows input of patient demographic data, bed type, vendor, issue date, and contract expiration date. Several additional fields allow for the entering of clinical data pertaining to diagnosis and a Braden Scale score. When a patient no longer requires a special therapy bed, the logistics technician enters the date of termination into the system and archives the record into a storage file. Logistics technicians can access the storage file and

retrieve any record.

At any time, the logistics technician, clinical nurse specialist, or administrator can obtain a print out of the patients currently occupying special therapy beds at WRAMC. This information can be used by the clinical nurse specialists to determine their patient's location as they conduct follow up evaluations. The information on patient diagnoses, clinical justification for placing patients on the beds, and Braden Scale scores can be used by the clinical nurse specialists to evaluate the appropriateness of special therapy bed use at WRAMC. The logistics personnel and administrators can obtain a summary of financial reports by vendor and a current total of special therapy bed days used during that fiscal year.

The most important benefit of this tracking system is the improvement in management control exercised by both clinical and administrative staff. The easy access to and availability of this instantaneous information concerning the status of special therapy bed use will assist decision makers in their attempts to control the appropriate use of this technology.

Logistics technicians in the Sixth Floor Central Receiving Office are currently testing the database

program. The staff have suggested several changes to the programmer and he is incorporating these improvements into the final program. The system should be fully operational by the time the Hospital Logistics Division assumes responsibility for managing the special therapy beds.

Several problems exist with the processing of both current and past due payments to special therapy bed vendors. It is proposed that the current policy of a 14 day initial rental period followed by 30 day extensions of the rental contract be changed to an initial 30 day rental contract followed by 30 day extension periods. This will greatly reduce the amount of paperwork generated in the management of this rental equipment. Use of the computerized database tracking system will allow WRAMC to produce its own accurate records of rental information to compare with those of the vendors. The establishment of two sources of matching data, the vendor's and WRAMC's, will facilitate the reconciliation of account discrepancies.

A solution to the illegal procurements occurring after normal duty hours is to include the clinical expert into the ordering process. A telephone call from the nursing supervisor or ward nurse to the

clinical nurse specialists can confirm the emergent nature of the request. If the patient's condition still warrants the immediate use of a special therapy bed, the nursing supervisor can contact the contracting representative on call to obtain the bed. Lovell (1990) suggests that most orders for special therapy bed are routine and can wait until the next business day. The only exception to this guideline is the need for a rotating kinetic therapy bed for a trauma patient with spinal cord injuries.

Following a guideline like this is essential to control the ordering of these beds during other than normal duty hours. Staff nurses, nursing supervisors, administrators, and physicians must understand that most patient conditions do not demand an emergency procurement of expensive pressure relieving technology. They must also realize that simple nursing actions such as the frequent turning of patients and appropriate skin care measures will serve patients well until more definitive pressure relieving therapy can be initiated.

An efficient and effective special therapy bed management system can be achieved at Walter Reed Army Medical Center. The framework for the system has been in place for several years. Problems of adequate

management control have plagued the system throughout its history. The lack of management control is not uncommon in systems immersed in the use of evolving technology.

The key to a successful special therapy bed management system is a concerted effort to assess on a continual basis the needs of the skin compromised patient and to stay informed of the innovations in pressure relieving technology. Incorporating these two objectives into the WRAMC management philosophy will turn an out of control bed management system into an effective and efficient high performing system.

Recommendations for improving the effectiveness and efficiency of the special therapy bed management system at WRAMC include:

1. Allowing the clinical nurse specialists to serve as skin care experts involved in the management of all patients requiring pressure relieving therapy. The clinical nurse specialists would be responsible for (a) consultations with physicians and nurses interested in utilizing special therapy beds, (b) continual evaluations (every two to seven days) of patients using special therapy beds, and (c) having the approval signature on all memorandums requesting special therapy

beds thus verifying use of the most appropriate type of pressure relieving device for patients.

2. Establishing of an educational program to supplement the vendor sponsored inservices. This instruction would be directed at staff nurses and medical residents and focus on (a) the process of ordering beds at WRAMC, (b) the clinical indicators used in determining a patient's need, (c) cost effectiveness of selecting the most appropriate pressure relieving device, and (d) the importance of continual monitoring of patients placed on the beds to ensure effective therapy.

3. Implementing a computerized database to track special therapy bed use and provide a permanent record of each case of special therapy bed use at WRAMC.

4. Extending the initial contracting period for all special therapy bed rentals to 30 days.

5. Notifying a clinical nurse specialist prior to the rental of a special therapy bed after normal duty hours (evenings, weekends and holidays). Nursing supervisors must consult with the clinical nurse specialists to determine if a true emergency exists before ordering a special therapy bed after normal duty hours.

Chapter VI - References

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Appendix A

Kinair Therapy Bed SOP

Walter Reed Army Medical Center

September 27, 1988



REPLY TO
ATTENTION OF:

HS HL-MAA-VI

DEPARTMENT OF THE ARMY
WALTER REED ARMY MEDICAL CENTER
WASHINGTON, D.C. 20307-5001



27 September 1988

KINAIR THERAPY BED SOP

1. **PURPOSE:** To provide a standardized management procedure and centralized point of control for all WRAMC-owned and rented Kinair therapy beds.
2. **APPLICABILITY:** This SOP provides procedures to be used by the staff of the Directorate of Medical Activities Administration of Walter Reed Army Medical Center when a requirement exists for use of a Kinair Therapy bed.
3. **SCOPE:**
 - A. The 6th Floor Central Receiving will exercise responsibility as the central control point for use of all WRAMC-owned and rented Kinair therapy beds.
 - B. For WRAMC-owned beds, the 6th Floor Central Receiving will be responsible for issuing, arranging for proper storage, ordering of accessories, coordinating for maintenance/servicing, and coordinating for "special handling" laundry services for Kinair "Gortex" fabrics.
 - C. The Associate Administrators for Floors 4, 5, 6, and 7 will insure an adequate number of logistics technicians are trained to clean and service the Kinair therapy beds that are to be used on their wards.
4. **RESPONSIBILITIES:**
 - A. **Request for Bed:**
 - (1) Once a physician has determined a requirement for a Kinair therapy bed, the nursing/MRT staff on the Ward will advise the appropriate Unit Administrator (UA) of the requirement.
 - (2) The UA will insure that a written request form (DF) is completed by the requesting physician and approved by the appropriate service or department chief. Copies of the overprinted DF are available through each UA and each floor's central receiving area. Beds may be requested for a period up to 14 days. If an extension of the 14-day period is necessary whether for a WRAMC-owned bed or a rental bed, a repeat of the same written request/approval procedure that was used to initially obtain the bed is required. Requests for extensions on use of WRAMC-owned beds should be submitted to the 6th Floor Central Receiving NLT the 13th day of each 14 day usage period.

Kinair Therapy Bed SOP
27 September 1988

(3) Once the written request (DF) is approved the UA will contact the 6th Floor Central Receiving, Room 6Z39 (576-2554 or 576-5001) to determine whether a WRAMC-owned Kinair therapy bed is available for issue.

(a) If a WRAMC-owned Kinair therapy bed is not available; the 6th Floor Central Receiving will take information from the UA (patient's name, location, and expected duration of the requirement) and concur in the initiation of a rental agreement (DA Form 3953) for a bed.

(b) If a WRAMC-owned Kinair therapy bed is available, the 6th Floor Central Receiving will advise the UA as to the location where it can be picked-up. The requesting UA has responsibility for pick-up and delivery of the bed to the patient's room. When delivered, the bed will have all 23 cushions in place, along with two Gortex sheets and an operator's manual.

B. Responsibilities during use:

(1) The Department of Nursing staff will be responsible for putting the bed into operation. (i.e.: setting air pressures, getting the patient into the bed, etc).

(2) The Department of Nursing staff will be responsible for daily care and periodic changing of the Gortex sheets.

(3) When a sheet is changed, the ward logistics technician will take it to the 6th Floor Central Receiving for special laundry handling.

(4) Requests for maintenance, bed accessories for special patients, new sheets or air cushions, etc. for WRAMC-owned Kinair beds will be referred to the 6th Floor Central Receiving for action. Requests for service, maintenance, accessories, etc. for rental beds will be handled by the appropriate UA in accordance with normal contracting procedures.

C. Bed Turn-In

(1) When the requirement terminates for use of a WRAMC-owned or a rental Kinair bed, the responsible UA should advise the 6th Floor Central Receiving (6-2554 or 6-5001) ASAP.

(2) Coordination for terminal cleaning of WRAMC-owned beds will be handled from the 6th Floor Central Receiving Section. A logistics technician will be dispatched to disassemble the bed (i.e. remove the 23 air cushions, clean the air filter, etc.) The floor housekeeping supervisor will be

Therapy Bed SOP
27 September 1988

contacted to provide a housekeeper for cleaning of the bed. Kinair therapy beds will be cleaned using the same cleaning protocol as regular patient beds.

(3) After the bed is cleaned, the responsible logistics technician will contact 6th Floor Central Receiving for instructions on disposition of the bed. Typically the bed will either go to another ward for immediate use or to Central Materiel Section (CMS) on the second floor for temporary storage.

5. AFTER NORMAL DUTY HOURS REQUIREMENTS:

A. There will not be any issue of WRAMC-owned or rental Kinair beds after normal duty hours or on weekends/holidays.

B. Should a very unusual situation occur requiring turn-in, or maintenance/servicing of a Kinair bed (WRAMC-owned or rental) after normal duty hours, the following procedure should be used:

Contact the DMAA Evening Administrator, Monday - Friday from 1600-2300, Room 2J41, 576-1057/58 or the DMAA Administrator-on-call, Monday - Friday, 2300-0700 and around the clock on weekends/holidays through the AOD (576-2309). The AOD maintains a copy of the DMAA call roster.

NORBERT A. STINGLE
LTC, MS
Assistant Chief of Staff and Director,
Medical Activities Administration

Special Therapy Bed Management System

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Appendix B

Department of Nursing Administrative Policy F-10

Walter Reed Army Medical Center

November 1988

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Department of Nursing
Administrative Policy F-10
November 1988

Therapy Beds
(Criteria for Use of Low Airloss
and Air Fluidized Therapy Beds)

1. Purpose: To establish criteria, guidelines and nursing responsibilities for using special therapy (Low Airloss/Air Fluidized) beds.
2. Scope: This policy applies to all department of nursing staff members involved in direct patient care.
3. Responsibility: The professional nurse is responsible for identifying patients at risk for skin breakdown and ensuring appropriate therapy devices (beds) are used whenever available.
4. Procedure:
 - a. Skin integrity will be assessed on all patients upon admission and daily in accordance with the Department of Nursing Policy (DNAP), "Pressure Sore Prevention and Management".
 - b. Those patients who are identified at risk per DNAP assessment criteria will be considered for the most appropriate pressure relief device (Pressure Sore Device Decision Tree).
 - c. Patients who may benefit from use of the therapy beds include:
 - 1) Patients with intractable pain
 - 2) Closed head injuries
 - 3) Spinal cord injuries
 - 4) Patients with burns and/or grafts
 - 5) Patients with metastatic bone cancer
5. Responsibility for Procurement of Rental or Purchased Beds:
 - a. The need for a low airloss (Kinair, Flexicair) or fluidized therapy bed (Clinitron) may be identified by a nurse or physician.
 - b. The physician must complete a written DF requesting the therapy bed. This DF is available through the Unit Administrator (UA) or from each floor's Central Receiving Section.
 - c. The requesting Unit Administrator is responsible for pick-up and delivery of the bed to the patient's room. When delivered, the bed will have all 23 cushions in place, along with two Gortex sheets, and an operator's manual.
 - c. The turn-in and cleaning of a bed are also the responsibility of the unit administrator and the 6th Floor Central Receiving Section (576-2554/5001).

Department of Nursing
Administrative Policy F-10
November 1988

d. Special therapy beds will not be issued after normal duty hours or on weekends or holidays. Should a very unusual situation occur requiring turn-in, or maintenance/servicing after normal duty hours, the DMAA Evening Administrator (Mon-Fri from 1600-2300, Room 2J41, 576-1057/58) or the DMAA Administrator-on-call (Mon-Fri, 2300-0700) should be contacted through the AOD.

6. Operation of Bed (Kinair):

a. WRAMC-owned therapy beds:

1.) The nursing staff members will be responsible for putting the bed into operation once it is received on the ward (i.e. setting air pressures, getting the patient into bed, etc.) as well as daily care and periodic change of the Cortex sheet.

2.) Soiled sheets will be given to the ward logistics technician for special laundry handling in the 6th Floor Central Receiving Section.

3.) Requests for bed accessories for special patients, new sheets or air cushions, etc. will be referred to the Sixth Floor Central Receiving.

4.) Nursing personnel will notify the 6th floor Central Receiving Section when a bed is ready for turn-in

b. Rental beds: Requests for service, maintenance, accessories, etc. for rental beds will be handled by the appropriate UA in accordance with normal contracting procedures. The bed company representative will take care of pressure setting changes, laundering and exchange of sheets, maintenance, turn-in etc, of rental beds.

7. Special Considerations:

a. Extension for use of a therapy bed to exceed 14 days requires contact with the unit administrator.

b. If a WRAMC-owned KINAIR therapy bed is not available, the 6th Floor Central Receiving will take information from the UA (patient's name, location, and expected duration of the requirement) and initiate a rental agreement for a bed.

c. Questions concerning operation or management of the beds should be directed to the unit administrator, bed company representative, or Medical/Surgical or Critical Care Clinical Nurse Specialist.

Appendix C

Decision Paper on the Purchase of
Pressure Sore Therapy Devices
for Walter Reed Army Medical Center
July 20, 1990

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HSHL-RM

20 July 1990

MEMORANDUM FOR: See Distribution

SUBJECT: Decision Paper - Purchase of Pressure Sore Therapy Devices

1. Background. WRAMC currently rents four different types of devices used in the treatment of pressure sores of varying degrees. These devices are low air loss beds (Kinair, Flexicare), low air loss, static/dynamic flotation mattress (Mediscus DFS), air fluidized beds (Clinitron, Fluidair) and kinetic therapy beds (BioDyne, Restcure). These technologies have been introduced to WRAMC over the past several years. Use rates of the low air loss beds were so great that in 1988 WRAMC purchased 8 of these beds. The purchase of these beds has not controlled the rate of use of the low air loss or other therapy devices. Using a sample of data from the same period of time over the past three fiscal years, the use of these beds increased from FY88 - FY89 by 11% and from FY89 - FY90 by 33%. In view of the amount of contract expenditures, close analysis of device use has been made for the purpose of determining if purchase of any of these devices is appropriate (see attached matrix).

2. Options. WRAMC may exercise three main options to reduce the rental expenditure of these therapy devices:

- a. eliminate use of any rental devices;
- b. continue to rent any or all of the devices;
- c. purchase some devices and continue to rent some devices.

3. Discussion.

a. Elimination of use of rental devices would relieve contract expenditures. As shown by the current use matrix, not all devices have high use rates, particularly the more specialized devices. Technology development as observed over the past three years also indicates that, in order to provide state-of-the-art standard of care for certain conditions, we should not restrict technology availability until items are purchased. Pursuit of this option is not recommended.

b. Continuation of device rental alone subjects WRAMC to a continuing expenditure. For some devices, this may be appropriate, particularly since the current use rate is decreasing and other device technologies are being developed to accommodate those patients heretofore only being able to be managed on one particular device (e.g. Stage IV pressure sores may be managed on a low air loss bed instead of exclusively on the air fluidized bed). At least three companies provide "like items" for several different types of devices WRAMC rents. Competition is keen among these vendors as reflected in the reduction of their rental rates analyzed over the past three years. Uncontrolled use rates of these devices will result in fewer dollars spent per bed per day and will permit easy adoption of a less expensive but satisfactory therapy device. (Comparison of the effectiveness of these therapy devices is the subject of a separate

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clinical nursing research project. The results are not expected in the immediate future.) The current use rate of three rental devices, however, far exceeds the uncontested rental limit DA permits. Continued rental of these devices only is not recommended. : :

c. Purchase of some devices and continued rental of some devices would provide WRAMC with relief from some contract expenditures and provide access to improving technology. Theoretically, savings to WRAMC from device purchase would be the rental rate for the device once the payback period was met. Rental savings for devices needed over the number purchased are a function of competitive pricing among vendors. Purchase of additional therapy devices is recommended in conjunction with continued rental of certain therapy devices.

4. Recommendations for Purchase and Rental of Therapy Devices.

a. Objective analysis of device use rates, purchase and rental rates charged, estimated expenditures to date and observed technology improvements indicate that WRAMC should buy the Mediscus DFS mattress. This mattress has been marketed as capable of treating all four stages of pressure sores. Review of the records of device orders indicate that, for certain patients, in the absence of a WRAMC-owned low air loss bed, physicians are as satisfied with use of the DFS. Thus, a less expensive device has been used satisfactorily to treat the same clinical condition treated by the low air loss bed.

b. The DFS has the earliest payback period (250 days), the greatest number of devices used in the hospital, and costs the least to buy.

c. The low air loss bed is not recommended for purchase because some of its use has been transferred to the DFS (rate of use over the past FY has increased at a decreasing rate since introduction of the DFS) and WRAMC does own some of these beds which makes its technology available without rental in cases where a DFS is not satisfactory.

d. Purchase of 4 DFS mattresses is proposed. This number is based on analysis of justification for orders of the devices. All order forms available were analyzed and only those forms which had no justification documented were discounted. (i.e. Judgement was not made on the appropriateness of the order.)

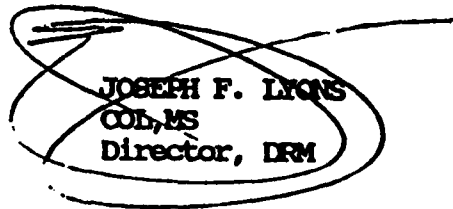
e. Purchase of the mattresses under the Quick Return on Investment Program is recommended. The mattresses meet the criteria for purchase under this program and would not jeopardize the WRAMC CEEP program.

f. Purchase of kinetic therapy at this point in time is not recommended because WRAMC already owns a kinetic device (the Roto-rest bed) which has not been used in recent history. This device is currently in the process of being evaluated as an acceptable alternative to the BioDyne bed. Furthermore, this device is more specialized than the DFS. In view of WRAMC-owned kinetic therapy, further evaluation of these devices is needed before a purchase decision should be made.

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5. Recommend WRAMC purchase 4 DFS mattresses under the Quick Return on Investment Program.



JOSEPH F. LYONS
COL, MS
Director, DRM

Encl

Coordination:

Chief of Staff	concur/nonconcur	_____	Date	_____
C, DOM	concur/nonconcur	_____	Date	_____
C, DON	concur/nonconcur	_____	Date	_____
C, DOS	concur/nonconcur	_____	Date	_____
C, FM&R	concur/nonconcur	_____	Date	_____
DOCS	concur/nonconcur	_____	Date	_____
DMAA	concur/nonconcur	_____	Date	_____
DOC	concur/nonconcur	_____	Date	_____
DOL	concur/nonconcur	_____	Date	_____

RENTAL THERAPY BED ANALYSIS MATRIX

To Buy = + Not to Buy = -	Low Air Loss Bed (Kinair, Flexicare)	Low Air Loss Mattress (DFS)	Kinetic Therapy (BioDyne, Restcue)	Air Fluidized Bed (Clinitron, Fluidair)
1. FY 90 Use Rate (#/day)	5.77(+)	6.54 (+)	.89 (-)	.56 (-)
2. Use Trend (↑ or ↓)	↑ at a ↓ rate (-)	↑ (not used in 89) (+)	↑ (not used in 89) (+)	↓ (-)
3. Alternative WRAMC owned Technology	Kinair Beds (-)	(-) Kinair(-) Sof.Care	Roto-rest Bed (-)	None (-) (Kinair)
4. Indications for Use (Flexibility)	Sore StagesII- IV(+3)	Sore StagesII- IV(+3)	Sore Stages II-IV Hemodynamic Pulm. Instab (+4)	Stage IV (-)
5. Use Rate Expected to Remain the Same	No (↓) (-)	No (↓) (-)	No (↓) (-)	Yes (-) (+)
6. Effectiveness of Use				
7. \$ to rent/day	\$44.50	\$30.00	\$154.00 Average	\$75.00
8. \$ to buy one	\$14,355.	\$7500.	\$39,995.	\$30,000.
9. Payback Period	323 days	250 days	260 days (292 @ WR rate)	400 days (714 @ WR rate)
10. Est.FY 90 rental fees to date (Meets \$15,000 rental limit)	\$62,344. (+)	\$47,700. (+)	\$33,572. (+)	\$10,200. (-)
SCORES				
TO BUY (+)	+5	+6	+6	+1
DO NOT BUY (-)	-3	-3	-3	-5
NET	+2	+3	+3	-4

Appendix D

Memorandum used in the ordering of
special therapy beds at
Walter Reed Army Medical Center

Special Therapy Bed Management System

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MEMORANDUM TO: FLOOR ADMINISTRATOR, FLOOR _____

FROM: WARD _____

Subject: Request for Hospital Therapy Beds

1. WRAMC _____ Contract _____ Renewal _____ Date: from _____ to _____.

2. Type of Bed:

Low air loss

Air Fluidized

_____ Kinair _____ Flexicair _____ Clinitron _____ Fluid Air

3. Accessories requested: C = Charged NC = Non Charge

Kinair

_____ Bed Scale (C)
_____ Patient Helper
_____ HEPA Filter (C)
_____ Traction setup (NC)
_____ U-shaped pillows (NC)
_____ Bumper Pads (NC)

Flexicair

_____ Bed Scale (C)
_____ Foot Drop Pillows (NC)
_____ Foot Drop Board (NC)
_____ Bumper pads (NC)
_____ Traction C-rings (NC)

Mediscus

_____ DFS unit
(Dynamic
Flotation
System)

Clinitron

_____ Latex Sheet (NC)
_____ Wedge Pillow (NC)

Fluidair

_____ Gortex Sheet (NC)
_____ Wedge Pillow (NC)

NOTE: All WRAMC owned equipment will be used prior to rental.

4. Patient Name _____ Hospital Number _____

SSN _____ Age _____ Sex _____ Height _____ Weight _____

Present location of Patient: Ward _____ Room _____;

Primary Physician and Present Location: _____

5. Justification for order of Therapy Bed: _____

Primary Physician Signature

____ Approved ____ Disapproved Chief of Department Signature

Assistant Administrator _____ Date _____